Operating Instructions

(Translation of original)

BRINKMANN Immersion Pumps

TH/STH2…TH/STH6

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Order - No.: BE3920 ENGLISH

Brinkmann Immersions pumps of the series TH/STH2 ... TH/STH6

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1 Indication to the manual

This operating manual gives basic instructions which are to be observed during installation, operation and maintenance of the pump. It is therefore imperative that this manual be read by the responsible personnel and operator prior to assembly and commissioning. It is always to be kept available at the installation site.

1.1 Identification of safety instructions in the operating manual

Safety instructions given in this manual non-compliance with which would affect **safety** are identified by the following symbol

Safety sign according with ISO 3864 – B.3.1

or where **electrical safety** is involved, with:

Safety sign according with ISO 3864 – B.3.6

Where non-compliance with the safety instructions may cause a risk to the machine and it's function the word

ATTENTION

is inserted.

2 Description of product

2.1 General description of the pump

Pumps of this type are multi-stage rotary pumps. Series TH/STH use closed impellers in order to minimizing power consumption and to optimize hydraulic pump efficiencies. In addition, the TH/STH series offers high pressures at short immersion depths.

The pump shaft and the motor shaft are connected by a coupling. The pump shaft is sealed by a rotating mechanical seal. The pump is protected again impurity by a filter. Pump and motor form a compact and space-saving unit.

Vertically mounted pumps are equipped with a mounting flange. The pump end immerses into the tank and the motor extends vertically above the tank.

2.2 Intended use

The immersion pumps of the series TH/STH have been especially developed to supply internally cooled tools with coolant fluid within the limiting application in accordance with table 1.

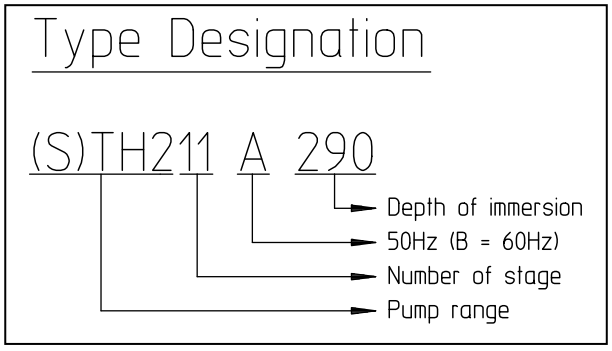
Limit of Application (Table 1)

Type	TH/STH2...6
Mediums	Industry water, cooling emulsions, cooling- and cutting-oils
Kinetic viscosity of the medium	...25 mm^2/s
Temperature of medium	0 ... 80 °C
Particle-size in the medium	1 mm
max. operation pressure	27 bar
min. delivery volume	1% of Q max.
Dry running	The pumps are not suitable for dry running.
Switching-on frequency per hour	Motors less 3 kW max. 200 from 3 kW to 4.0 kW max. 40 from 5.0 kW to 10.3 kW max. 20
Ambient temperature	40 °C
Set-up altitude	1000 m

ATTENTION

The pumps are to be operated within their design limits. Applications outside of these limits are not approved. The manufacturer is not responsible for any damages resulting from use of the pumps in such applications.

2.3 Type Designation



2.4 Technical data

50 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height **H** mm	Depth of immersion **h** mm	Weight TH[1] kg	Power kW	Noise level[2] dBA
(S)TH203A190	1.9	36	291	190	14.4	0.45	58
(S)TH204A190	2.2				14.5		
(S)TH205A190	2.8				14.6		
(S)TH206A190	3.4				14.7		
(S)TH207A290	4			290	15.2		
(S)TH208A290	4.4	38	291	290	15.6	0.54	58
(S)TH209A290	5.0				15.7		
(S)TH210A290	5.8				15.8		
(S)TH211A290	6.2				15.9		
(S)TH212A390	6.8	42	309	390	18.1	0.75	58
(S)TH213A390	7.5				18.2		
(S)TH214A390	8.2				18.3		
(S)TH215A390	9.0	42	309	390	19.2	0.92	58
(S)TH216A390	9.5				19.3		
(S)TH217A490	10.0			490	19.8		
(S)TH218A490	10.6				19.9		
(S)TH219A490	11.2	45	329	490	20.9	1.1	58
(S)TH220A490	11.8				21.0		
(S)TH221A490	12.2				21.1		
(S)TH222A590	12.8			590	21.6		63
(S)TH223A590	13.7				21.7		
(S)TH224A590	14.1	45	352	590	29.0	1.3	63
(S)TH225A590	14.8				29.1		
(S)TH226A590	15.5	45	352	590	29.7	1.5	63
(S)TH227A690	16.0			690	30.2		
(S)TH228A690	16.8				30.3		
(S)TH229A690	17.5	45	352	690	30.8	1.7	63
(S)TH230A690	18				30.9		
(S)TH231A690	18.5				31.0		
(S)TH232A790	19.0			790	31.5		
(S)TH233A790	19.6				31.6		
(S)TH234A790	20.2	45	376	790	35.6	1.9	63
(S)TH235A790	20.8				35.7		
(S)TH236A790	21.5				35.8		
(S)TH237A890	22.0	48	376	890	36.8	2.2	63
(S)TH238A890	22.6				36.9		
(S)TH239A890	23.2				37.0		
(S)TH240A890	24.0				37.1		
(S)TH241A890	24.5				37.2		

1) Weight STH = Weight TH + 2 kg

2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m .

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

50 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height **H** mm	Depth of immersion **h** mm	Weight TH[1] kg	Power kW	Noise level[2] dBA
(S)TH403A190	2.0	70	291	190	14.4	0.45	58
(S)TH404A190	2.8				14.5		
(S)TH405A190	3.8	72	291	190	14.9	0.54	58
(S)TH406A190	4.2				15.0		
(S)TH407A290	5.1	75	309	290	17.8	0.75	58
(S)TH408A290	5.9				17.9		
(S)TH409A290	6.6				18.0		
(S)TH410A290	7.3	80	309	290	19.0	0.92	58
(S)TH411A290	8.0				19.1		
(S)TH412A390	8.8	80	329	390	20.5	1.1	63
(S)TH413A390	9.2				20.6		
(S)TH414A390	10.1	85	352	390	27.9	1.3	63
(S)TH415A390	11.0	85	352	390	28.5	1.5	63
(S)TH416A390	11.9				28.6		
(S)TH417A490	12.5	85	352	490	29.1	1.7	63
(S)TH418A490	13.2				29.2		
(S)TH419A490	14.0	85	376	490	33.3	1.9	63
(S)TH420A490	14.8				33.4		
(S)TH421A490	15.6	85	376	490	34.0	2.2	63
(S)TH422A590	16.2			590	34.5		
(S)TH423A590	17.0				34.6		
(S)TH424A590	17.8				34.7		
(S)TH425A590	18.6	90	386	590	35.3	2.6	63
(S)TH426A590	19.2				35.4		
(S)TH427A690	20.0			690	36.0		
(S)TH428A690	20.8				36.1		
(S)TH429A690	21.7				36.2		
(S)TH430A690	22.4				36.3		
(S)TH431A690	23.2				36.4		
(S)TH432A790	24.0	90	441	790	47.0	3,3	71
(S)TH433A790	24.8				47.1		
(S)TH434A790	25.4				47.2		
(S)TH435A790	26.0				47.3		
(S)TH436A790	27.0				47.4		

1) Weight STH = Weight TH + 2 kg

2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

50 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height **H** mm	Depth of immersion **h** mm	Weight TH[1] kg	Power kW	Noise level[2] dBA
(S)TH603A190	2.0	140	291	190	14.7	0.54	58
(S)TH604A190	2.8	140	309	190	16.5	0.75	58
(S)TH605A240	3.8			240	16.8		
(S)TH606A240	4.2	140	309	240	17.7	0.92	58
(S)TH607A290	5.2			290	18.0		
(S)TH608A290	6.0	140	329	290	19.0	1.1	58
(S)TH609A340	6.8	140	352	340	26.5	1.5	63
(S)TH610A340	7.6	140			26.6		
(S)TH611A390	8.1	145	352	390	30.9	1.7	63
(S)TH612A390	9.0	150	376	390	35.0	1.9	63
(S)TH613A490	9.8	150	376	490	35.5	2.2	63
(S)TH614A490	10.4				35.6		
(S)TH615A490	11.2				35.7		
(S)TH616A490	12.0	160	386	490	36.3	2.6	63
(S)TH617A590	12.8			590	36.8		
(S)TH618A590	13.2				40.0		
(S)TH619A590	14.1	160	441	590	50.6	3.3	71
(S)TH620A590	15.1				50.7		
(S)TH621A690	16.0			690	51.2		
(S)TH622A690	16.8				51.3		
(S)TH623A690	17.6	170	441	690	53.8	4.0	71
(S)TH624A690	18.1				53.9		
(S)TH625A790	19.0			790	54.5		
(S)TH626A790	19.8				54.6		
(S)TH627A790	20.5	170	477	790	71.2	5,0	71
(S)TH628A790	21.2				71.3		
(S)TH629A890	22.0			890	71.8		
(S)TH630A890	22.8				71.9		
(S)TH631A890	23.5				72.0		
(S)TH632A890	24.2				72.1		

1) Weight STH = Weight TH + 2 kg

2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

60 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height **H** mm	Depth of immersion **h** mm	Weight TH[1] kg	Power kW	Noise level[2] dBA
(S)TH203B190	2.4	40	291	190	14.4	0.45	61
(S)TH204B190	3.4				14.5		
(S)TH205B190	4.1	42	291	190	14.9	0.54	61
(S)TH206B190	5.1				15.0		
(S)TH207B290	6	45	309	290	16.8	0.75	61
(S)TH208B290	7.0				16.9		
(S)TH209B290	7.8				17.0		
(S)TH210B290	8.8				17.1		
(S)TH211B290	9.6	48	309	290	18.0	0.92	61
(S)TH212B390	10.2			390	18.5		
(S)TH213B390	11.2				18.6		
(S)TH214B390	12.0	48	329	390	19.6	1.1	61
(S)TH215B390	12.8				19.7		
(S)TH216B390	13.8	50	352	390	27.0	1.3	66
(S)TH217B490	14.5	50	352	490	28.0	1.5	66
(S)TH218B490	15.5				28.1		
(S)TH219B490	16.4				28.2		
(S)TH220B490	17.2	52	352	490	28.7	1.7	66
(S)TH221B490	18.0				28.8		
(S)TH222B590	19.0	55	376	590	33.2	1.9	66
(S)TH223B590	19.9				33.3		
(S)TH224B590	20.8	55	376	590	33.9	2.2	66
(S)TH225B590	21.8				34		
(S)TH226B590	22.5				34.1		
(S)TH227B690	23.2			690	34.6		
(S)TH228B690	24.1	55	386	690	35.2	2.6	66
(S)TH229B690	25.0				35.3		
(S)TH230B690	26.0				35.,4		
(S)TH231B690	26.5				35.5		

1) Weight STH = Weight TH + 2 kg

2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

60 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height **H** mm	Depth of immersion **h** mm	Weight TH[1] kg	Power kW	Noise level[2] dBA
(S)TH403B190	3.2	84	291	190	14.7	0.54	61
(S)TH404B190	4.2	84	309	190	17.1	0.75	61
(S)TH405B190	5.3				17.2		
(S)TH406B190	6.2	88	309	190	18.2	0.92	61
(S)TH407B290	7.6	88	329	290	19.6	1.1	61
(S)TH408B290	8.3				19.7		
(S)TH409B290	9.5	92	352	290	27.0	1.3	66
(S)TH410B290	11.8	92	352	290	27.6	1.5	66
(S)TH411B290	10.6	95	352	290	28.1	1.7	
(S)TH412B390	12.8			390	28.6		
(S)TH413B390	13.9	95	376	390	32.6	1.9	66
(S)TH414B390	15.0	100	376	390	33.2	2.2	66
(S)TH415B390	16.0				33.3		
(S)TH416B390	17.1	100	386	390	33.9	2.6	66
(S)TH417B490	18.1			490	34.4		
(S)TH418B490	19.2				34.5		
(S)TH419B490	20.2	105	441	490	44.7	3.3	75
(S)TH420B490	21.8				44.8		
(S)TH421B490	22.5				44.9		
(S)TH422B590	23.8			590	45.4		
(S)TH423B590	24.8				45.5		
(S)TH424B590	26.0	105	441	590	48.0	4.0	75

1) Weight STH = Weight TH + 2 kg

2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

60 Hz

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height **H** mm	Depth of immersion **h** mm	Weight TH[1] kg	Power kW	Noise level[2] dBA
(S)TH603B190	3.2	170	291	190	16.4	0.75	61
(S)TH604B190	4.2	170	309	190	17.5	0.92	61
(S)TH605B240	5.2	170	329	240	18.3	1.1	61
(S)TH606B240	6.2	175	352	240	25.4	1.5	66
(S)TH607B290	7.8	175	352	290	29.7	1.7	66
(S)TH608B290	8.4	185	376	290	33.8	1.9	66
(S)TH609B340	9.8	185	376	340	34.5	2.2	66
(S)TH610B340	10.8	195	386	340	35.1	2.6	66
(S)TH611B390	12.0			390	35.6		
(S)TH612B390	13.0				35.7		
(S)TH613B490	14.0	195	441	490	49.6	3.3	75
(S)TH614B490	15.2				49.7		
(S)TH615B490	16.2				49.8		
(S)TH616B490	17.8	200	441	490	52.3	4.0	75
(S)TH617B590	18.4			590	52.8		
(S)TH618B590	19.8	200	477	590	69.4	5.0	75
(S)TH619B590	20.8				69.5		
(S)TH620B590	22.0				69.6		
(S)TH621B690	23.0			690	70.1		
(S)TH622B690	24.0				70.2		
(S)TH623B690	25.2	210	477	690	71.2	5.5	75
(S)TH624B690	26.2				71.3		

1) Weight STH = Weight TH + 2 kg

2) Noise emissions measured in accordance with DIN 45635 at a distance of 1 m

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

3 Safety instructions

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant operator are to be observed.

3.1 Hazards in the event of non-compliance with the safety instructions

Non-compliance with the safety instructions may produce a risk to the personnel as well as to the environment and the machine and results in a loss of any right to claim damages.
For example, non-compliance may involve the following hazards:

- Failure of important functions of the machines/plant
- Failure of specified procedures of maintenance and repair
- Exposure of people to electrical, mechanical and chemical hazards
- Endangering the environment due to hazardous substances being released

3.2 Unauthorized modes of operation

- Pump may not be used in potentially explosive environments**!**
- Pump and discharge piping are not designed to hold any weight and may not be used as a step ladder.

3.3 Remaining Risk

Risk of Injury!
Risk of squeezing or crushing body parts when installing or removing the pump exists. Proper and secured lifting tools must be used.

Risk of burns!
The pump must have cooled down sufficiently prior to commencing any repair, maintenance or installation.

3.4 Qualification and training of operating personnel

The personnel responsible for operation, maintenance, inspection and assembly must be adequately qualified. Scope of responsibility and supervision of the personnel must be exactly defined by the plant operator. If the staff does not have the necessary knowledge, they must be trained and instructed, which may be performed by the machine manufacturer or supplier on behalf of the plant operator. Moreover, the plant operator is to make sure that the contents of the operating manual are fully understood by the personnel.

3.5 Safety instructions relevant for operation

- If hot or cold machine components involve hazards, they must be guarded against accidental contact.
- Guards for moving parts (e.g. coupling) must not be removed from the machine while in operation.
- Any leakage of hazardous (e.g. explosive, toxic, hot) fluids (e.g. from the shaft seal) must be drained away so as to prevent any risk to persons or the environment. Statutory regulations are to be complied with.
- Hazards resulting from electricity are to be prevented (see for example, the VDE Specifications and the bye-laws of the local power supply utilities).
- The pumps' stability against falling over is not ensured unless it is properly mounted onto the tank.
- The female threads on the motor MUST NOT be used to lift the entire pump and motor assembly.

3.6 Safety instructions relevant for maintenance, inspection and assembly work

Any work on the machine shall only be performed when it is at a standstill, it being imperative that the procedure for shutting down the machine described in this manual be followed.
Pumps and pump units which convey hazardous media must be decontaminated.
On completion of work all safety and protective facilities must be re-installed and made operative again.
Prior to restarting the machine, the instructions listed under "Start up" are to be observed.

3.7 Signs on the pump

It is imperative that signs affixed to the machine, e.g.:

- arrow indicating the direction of rotation
- symbols indicating fluid connections

be observed and kept legible.

3.8 Unauthorized alterations and production of spare parts

Any modification may be made to the machine only after consultation with the manufacturer. Using spare parts and accessories authorized by the manufacturer is in the interest of safety. Use of other parts may exempt the manufacturer from any liability.

4 Transport and storage

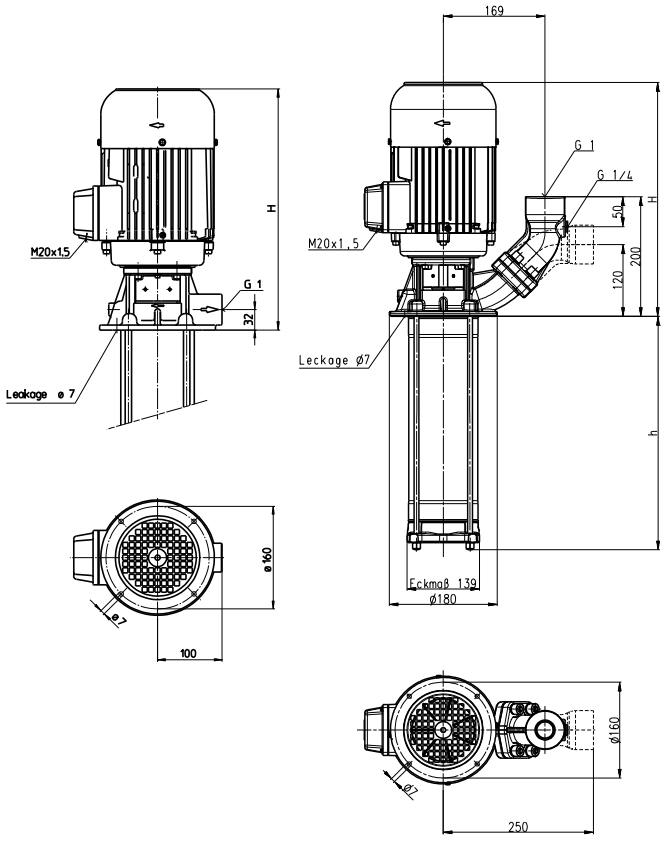
Protect the pump against damage when transporting.
The pumps may only be transported in a horizontal position and hooks or straps must be attached on the motor and pump end.
Do not use the pump shaft for connecting any transportation aids such as hooks or straps.
Pumps must be drained prior to their storage.
Store pump in dry and protected areas and protect it against penetration of foreign bodies.
Always store pump above the freezing point!

5 Installation and Connection

5.1 Mechanical installation

During any assembly or disassembly process the pumps must be secured against tipping trough ropes for example at all times.
Pumps must be mounted securely. Piping, tank and pumps must be mounted without any tension.
The inlet is at the bottom of the immersed pump body. The distance between the inlet and the tank bottom must be so large that the inlet cannot be blocked by deposits during longer shutdowns.
The leakage is collected in a leakage chamber and drained off by the leakage hole into the tank. During the assembling of the pump, be sure that the leakage hole is free.
To obtain the full flow rate it is recommended to choose for the pipework the nominal bore diameter of the pumps cross section for connection. Therefore pipe bends should be used, not pipe angles!
The pipework must be qualified for occuring hydraulic pressure.

TH2...6 STH2...6



ATTENTION

Pay attention of the max. tightening torque for piping connection

Type	Pipe connection	Cast iron	Brass
TH2...6	G 1	90 Nm	50 Nm
STH2...6	G 1	90 Nm	-

When installed the space around the pump must be large enough to provide sufficient cooling of the motor.

Do not prop up the pressure line via the joining socket.

The pump must be mounted in that way that rotating parts under the cover of the coolant tank can not be touched!

5.2 Electric wiring

All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board!

According to the European Standard EN809 a motor overload must be installed and properly set to the full load amps stated on the pump name plate.

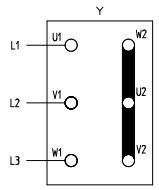
It is the responsibility of the machine operator to decide whether or not an additional emergency switch must be installed.

5.2.1 Circuit

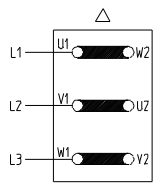
Tension voltage and frequency must correspond with the shown specification on the nameplate.
The pump must be wired so that a solid long term electrical connection is ensured. Establish a solid ground connection.

The electrical wiring must be performed according to the wiring diagram shown inside the terminal box cover. (Please see above sample wiring diagrams)

Wiring diagram e.g.



Star connection
3 x 400 V, 50 Hz
resp. 380-420 V, 50 Hz



Delta connection
3 x 230 V, 50 Hz
resp. 220-240 V, 50 Hz

There may be no foreign objects such as dirt, particles or humidity inside the terminal board.

Mount terminal board cover to motor tight against dust and humidity and close up all unused wiring ports.

ATTENTION

When Variable Frequency Drives are used interfering signals might occur.
Non-sinus shaped supply voltage from a variable frequency drive might result in elevated motor temperatures.

6 Start up / Shut down

6.1 Start up

ATTENTION

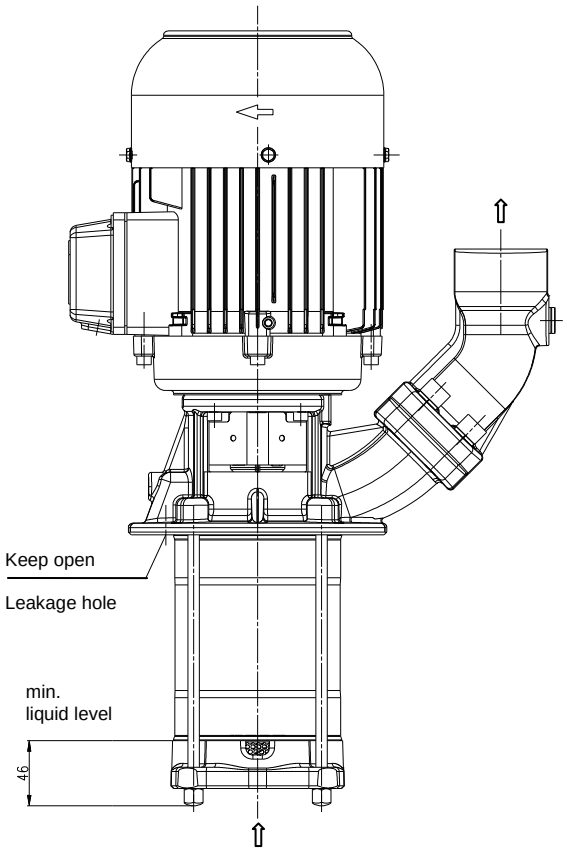
Switch off at the mains.
After connection the electrical wires, close the terminal box. Briefly start the motor (max. 30 sec.) and check the rotation according to the arrow on the top of the motor.
If the direction is incorrect change over two of the power leads.

6.2 Shut down

All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board! Open terminal box and disconnect the power leads. Empty out the pump.

7 Operation

Liquid level
Be sure that the suction hole of the pump body is immersed about 46 mm in the liquid (min. liquid level) before starting up the motor.



If the pump should lock up and cease, shut pump down (see 6.2) and disconnect from power supply. Pump must be uninstalled and removed from the system prior to its repair.

8 Servicing and Maintenance

ATTENTION

The surface of the motor must be kept free of dirt.

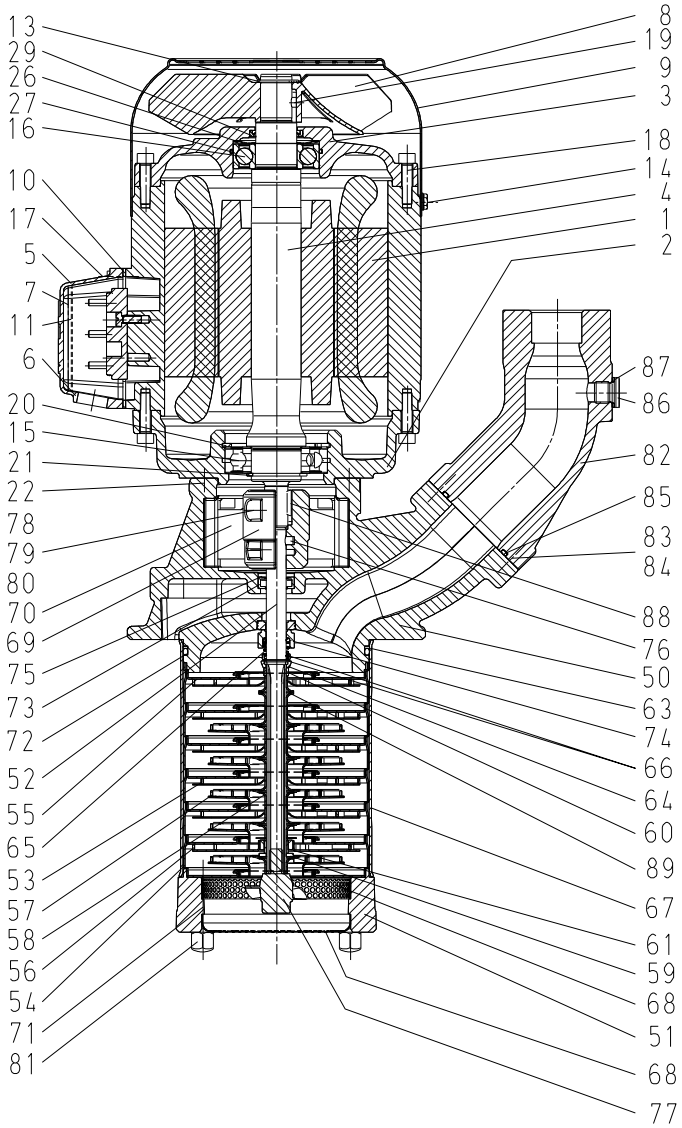
The motor shaft is spinning in permanently greased ball bearings (with special grease and increased bearing play) and does not require any special maintenance.

9 Trouble shooter's guide

Fault	Cause	Remedy
Motor does not start, no motor noise	At least two of the power supply leads have failed Overload has tripped	Check fuses, terminals and supply leads . Inspect overload
Motor does not start, humming noise	One of the supply leads has failed Impeller faulty Motor bearing faulty	See above Replace impeller Replace bearing
Overload trips	Pump locked up mechanically High on/of cycling frequency	Inspect pump hydraulics Check application
Power consumption is too high	Wrong direction of rotation of impeller Lime or other deposits mechanical friction	See above Clean pump mechanism repair pump
Motor overheats	High on/off cycling frequency Wrong power supply (voltage or cycles) Insufficient cooling	See above Power supply must correspond with name plate rating Check air flow at motor fan
Pump does not pump	liquid level too low Pump mechanism faulty Pipe blocked	Fill up liquid replace pump mechanism Clean pipe
Insufficient flow and pressure	Wrong direction of rotation of impeller Pump mechanism silted up Worn pump mechanism	Change over two power supply leads Clean pump mechanism Replace pump mechanism
Incorrect flow or pressure	Wrong power supply (voltage or cycles)	Power supply must correspond with name plate rating
Running noise/Vibration	Foreign objects in pump end Impeller damaged Bearing/Bushing broken	Remove foreign objects Replace impeller Replace bearing/bushing

10 Spare part

10.1 Spare part list for the immersion pumps of the series TH/STH2 ... 6



Item	Description		
1	Stator with terminal board		
2	Motor flange		
3	End shield		
4	Motor shaft with rotor		
5	Terminal box up to 4 kW		
6	Terminal box frame from 5.0 kW and over		
7	Terminal box cover from 5.0 kW and over		
8	Fan		
9	Fan cover		
10	Gasket		
11	Gasket from 5.0 kW and over		
13	Retaining ring		
13	Retaining ring 1.3…2.6 kW	DIN	471
14	Thread rolling screw from 1.3 kW and over	DIN	7500
15	Ball bearing	DIN	625
15	Ball bearing 1.3…2.6 kW	DIN	628
16	Ball bearing	DIN	625
17	Slotted cheese head screw	DIN	84
18	Stud bolt with bond up to 1.1 kW		
18	Hexagon socket head cap screw from 1.3 kW and over	DIN	912
19	Parallel pin	DIN	7
20	Retaining ring	DIN	472
21	Retaining ring	DIN	471
22	Socket head cap screw	DIN	912
26	Compensation disk from 1.3 kW and over		
27	O-ring from 1.3 kW and over		
29	Rotary shaft seal		
50	Pump body		
51	Intake cover		
52	Pump shaft		
53	Diffusor with sliding ring		
54	Entering stage with sliding ring		
55	Outflow stage (S)TH2...(S)TH4		
56	Bearing stage with sliding ring		
57	Impeller		
58	Spacer-long 2 x per stage		
59	Spacer-short 1 x per bearing stage		
60	Sliding ring		
61	Shaft sleeve		
63	Spiral backup ring		
64	Mech. seal stop ring cover		
65	Mech. seal stop half-ring		
66	Mech. seal washer up to (S)TH221A (S)TH421A and (S)TH616A (S)TH216B, (S)TH414B and (S)TH614B		
66	Mech. seal stop ring from (S)TH222A (S)TH422A and (S)TH617A (S)TH217B,(S)TH415B and (S)TH615B		
67	Pump casing		
68	Sieve		
69	Clamp coupling		
70	Coupling shield with M5 screw		
71	Stud bolt		
72	O-ring		
73	Rotary shaft seal		
74	Mechanical seal		
75	Retaining ring		
76	Parallel pin	DIN	7
77	Suction screw		
78	Hexagon socket head cap screw	DIN	912
79	Serrated lock washer	DIN	6798
80	Hexagon nut	DIN	934
81	Hexagon cap nuts	DIN	917
82	Joining socket STH		
83	Socket head cap screw STH	DIN	912
84	Spring washer STH	DIN	7980
85	O-ring STH		
86	Screw plug STH	DIN	908
87	Sealing ring STH	DIN	7603
88	Woodruff key	DIN	6888
89	Distance plate instead of impeller at empty stage for special depth of immersion		

10.2 Indications to the spare part order

Spare parts are available from the supplier.
Standard commercially available parts are to be purchased in accordance with the model type.
The ordering of spare parts should contain the following details:

1. **Pumptype**
   e.g. TH204A190
2. **Pump No.**
   e.g. 08153920
   The date of the construction year is a component of the pumps type number.
3. **Voltage. Frequency and Power**
   Take item 1, 2 and 3 from the nameplate
4. **Spare part with item No.**
   e.g. Impeller item No. 57

11 Repair

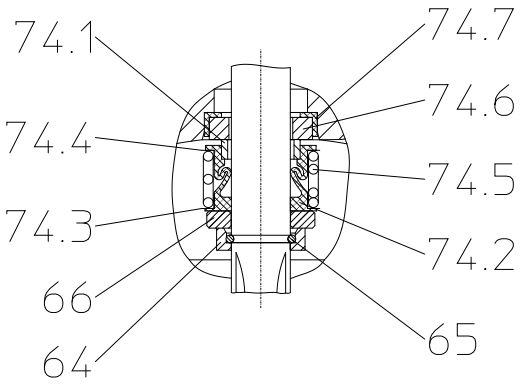
11.1 Exchange the rotary mechanical seal: up to (S)TH221A, (S)TH421A , (S)TH616A (S)TH216B, (S)TH414B , (S)TH614B

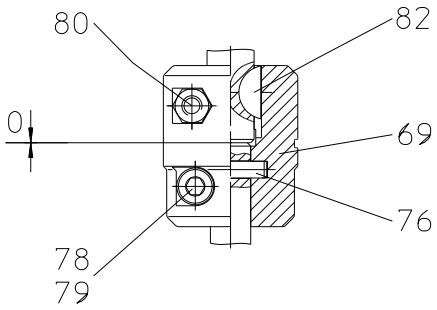
1) Disconnect the pump from the power supply.
2) Loosen the M5 screws and pull out coupling shield (70). Remove clamp coupling (69.1. 69.2) and parallel pin (76).
3) Loosen and pull off the hexagon cap nuts (81), the stud bolt (71) and the pump casing (67) from the pump unit. Remove pump unit with pump shaft (52) from the pump body (50).
4) Take off rotating axial face seal unit (74.1-74.5) and mech. seal washer (66) from the shaft (52) and clean the shaft. Pay attention to the drilled hole for the parallel pin (76) that it is without any bur. Check the sliding surface for the rotary shaft seal (73) for any damage.
5) Remove complete seal (74.6. 74.7) from the pump body (50) and clean the seat.
6) Mounting of the new axial face seal :
   Ensure that the sliding surfaces of the ring and the rotating axial face seal unit are free from grease and dirt.
   Moisten the angle-sleeve (74.7) of the counter ring lightly with rinse water / (water with washing-up liquid) and push the unit into the seat of the pump body (50).
   Slide the mech. seal washer (66) first and then the axial face seal (74.1-74.5) onto the pump shaft (52).
7) Lubricate lightly the lip of the rotary shaft seal (73) and push it into the pump body (50). Then insert the pump shaft (52) with the pump unit through the rotary shaft seal (73).
8) Fit together the coupling clamp (69) with the parallel pin (76) around the shafts, tighten the hexagon socket head cap screws (78) with the serrated lock washer (79) lightly.
   Be sure that the key of the motor shaft (4) coincides with the key groove of the coupling clamp(69.1). Press the pump shaft (52) toward the motor and tighten the screws.
   The distance between the two shaft ends **must be zero**.
9) Lubricate the O-ring seal (72) of the pump body (50), screw and put on the stud bolt (71), the hexagon cap nuts (81) and the pump casing (67).
10) Fit the coupling shield (70) into the pump body (50) and tighten the M5 screws.
11) Reconnect pump to the power supply.

Check direction of rotation!

Tightening torques for screwed connections

Thread - ∅	**M4**	**M5**	**M6**	**M8**	**M10**
Strength classes	4.8	4.8	8.8	8.8	8.8
Tightening torque (Nm)	**1** Nm	**3** Nm	**4.5** Nm **20** Nm Clamp coupling	**15** Nm **30** Nm Clamp coupling	**30** Nm





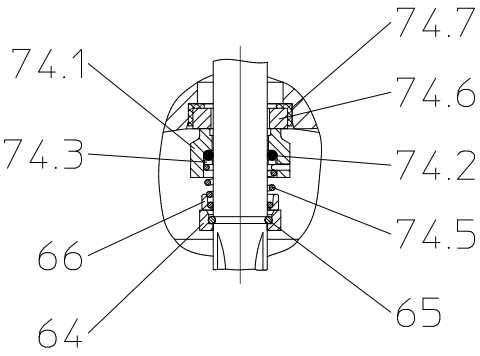
11.2 Exchange the rotary mechanical seal: from (S)TH222A, (S)TH422A , (S)TH617A (S)TH217B, (S)TH415B , (S)TH615B

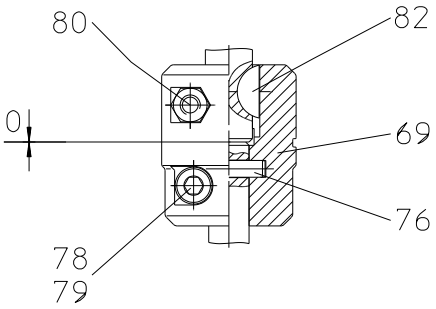
1) Disconnect the pump from the power supply.
2) Loosen the M5 screws and pull out coupling shield (70). Remove clamp coupling (69.1. 69.2) and parallel pin (76).
3) Loosen and pull off the hexagon cap nuts (81), the stud bolt (71) and the pump casing (67) from the pump unit. Remove pump unit with pump shaft (52) from the pump body (50).
4) Take off rotating axial face seal unit (74.1-74.5) and mech. seal stop ring (66) from the shaft (52) and clean the shaft. Pay attention to the drilled hole for the parallel pin (76) that it is without any bur. Check the sliding surface for the rotary shaft seal (73) for any damage.
5) Remove complete seal (74.6. 74.7) from the pump body (50) and clean the seat.
6) Mounting of the new axial face seal :
   Ensure that the sliding surfaces of the ring and the rotating axial face seal unit are free from grease and dirt.
   Moisten the angle-sleeve (74.7) of the counter ring lightly with rinse water / (water with washing-up liquid) and push the unit into the seat of the pump body (50).
   Slide the mech. seal stop ring (66) first and then the axial face seal (74.5-74.1) **(single part)** onto the pump shaft (52).
7) Lubricate lightly the lip of the rotary shaft seal (73) and push it into the pump body (50). Then insert the pump shaft (52) with the pump unit through the rotary shaft seal (73).
8) Fit together the coupling clamp (69) with the parallel pin (76) around the shafts, tighten the hexagon socket head cap screws (78) with the serrated lock washer (79) lightly.
   Be sure that the key of the motor shaft (4) coincides with the key groove of the coupling clamp(69.1).
   Press the pump shaft (52) toward the motor and tighten the screws.
   The distance between the two shaft ends **must be zero**
9) Lubricate the O-ring seal (72) of the pump body (50), screw and put on the stud bolt (71), the hexagon cap nuts (81) and the pump casing (67).
10) Fit the coupling shield (70) into the pump body (50) and tighten the M5 screws.
11) Reconnect pump to the power supply.

Check direction of rotation!

Tightening torques for screwed connections

Thread - ∅	M4	M5	M6	M8	M10
Strength classes	4.8	4.8	8.8	8.8	8.8
Tightening torque (Nm)	**1** Nm	**3** Nm	**4.5** Nm **20** Nm Clamp coupling	**15** Nm **30** Nm Clamp coupling	**30** Nm





12 Disposal

When disposing of the pump or the packaging materials the local and national regulation for proper disposal must be complied with.
Prior to its disposal, the pump must be completely drained and decontaminated if necessary.

13 EC declaration of conformity

DEUTSCH / ENGLISH /FRANÇAIS / ESPAÑOL

BRINKMANN PUMPS

EG-Konformitätserklärung

EC declaration of conformity / Déclaration de conformité CE / Declaración de conformidad CE

Hersteller / Manufacturer / Constructeur / Fabricante

Brinkmann Pumpen. K. H. Brinkmann GmbH & Co. KG
Friedrichstraße 2. D-58791 Werdohl

Produktbezeichnung / Product name / Désignation du produit / Designación del producto

Tauchpumpen / Immersion pumps / Pompes plongeantes / Bombas de inmersión

Typ / Type / Tipo **TH/STH2 … 6**

Das bezeichnete Produkt stimmt mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EG-Mitgliedsstaaten überein:
The named product conforms to the following Council Directives on approximation of laws of the EEC Member States:
Le produit sus-mentionné est conforme aux Directives du Conseil concernant le rapprochement des législations des Etats membres CEE:
El producto designado cumple con las Directivas del Consejo relativas a la aproximación de las legislaciones de los Estados Miembros de la CEE:

2006/42/EG	Richtlinie für Maschinen
2006/42/EC	Council Directive for machinery
2006/42/CEE	Directive du Conseil pour les machines
2006/42/CEE	Directivas del Consejo para máquinas
2004/108/EG	Richtlinie für elektromagnetische Verträglichkeit
2004/108/EC	Council Directive for Electromagnetic compatibility
2004/108/CEE	Directive du Conseil pour Compatibilité électromagnétique
2004/108/CEE	Directivas del Consejo para Compatibilidad electromagnética

Hinsichtlich der elektrischen Gefahren wurden gemäß Anhang I Nr. 1.5.1 der Maschinenrichtlinie 2006/42/EG die Schutzziele der Niederspannungsrichtlinie 2006/95/EG eingehalten.
With respect to potential electrical hazards as stated in appendix I No. 1.5.1 of the machine guide lines 2006/42/EG all safety protection goals are met according to the low voltage guide lines 2006/95/EG.
Conformément à l'annexe I N° 1.5.1 de la Directive "Machines" (2006/42/CE) les objectifs de sécurité relatifs au matériel électrique de la Directive "Basse Tension" ont été respectés.
Con respecto al potencial peligro eléctrico como se indica en el apéndice I No. 1.5.1 del manual de la máquina 2006/42/EG. todos los medios de protección de seguridad se encuentran según la guía de bajo voltaje 2006/95/EG.

Die Übereinstimmung mit den Vorschriften dieser Richtlinien wird nachgewiesen durch die vollständige Einhaltung folgender Normen:
Conformity with the requirements of this Directives is testified by complete adherence to the following standards:
La conformité aux prescriptions de ces Directives est démontrée par la conformité intégrale avec les normes suivantes:
La conformidad con las prescripciones de estas directivas queda justificada por haber cumplido totalmente las siguientes normas:

Harmonisierte Europ. Normen / Harmonised Europ. Standards / Normes europ. harmonisées / Normas europ. armonizadas

EN 809 :1998+A1 :2009+AC :2010 EN ISO 12100 :2010 EN 60204-1 :2006/AC :2010 EN 61000-3-2 :2006/A2 :2009 EN 61000-3-3 :2013 EN 61000-6-2 :2005/AC :2005 EN 61000-6-3 :2007/A1 :2011/AC :2012

Nationale Normen / National Standards / Normes nationales / Normas nacionales: **EN 60034-1 :2010/AC :2010**

Die Hinweise in der Betriebsanleitung für den Einbau und die Inbetriebnahme der Pumpe sind zu beachten.

The instructions contained in the operating manual for installation and start up the pump have to be followed.

Les indications d'installation / montage et de mise en service de la pompe prévues dans l'instruction d'emploi doivent être suivies.

Tenga en cuenta las instrucciones en el manual para la instalación y puesta en marcha de la bomba.

Brinkmann Pumpen, K. H. Brinkmann GmbH & Co. KG

Werdohl. 18.08.2015

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Norbert Burkl Leiter Qualitätsmanagement / Manager of quality management / Directeur de gestion de la qualité / Director de gestión de calidad

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